Table of Contents

Integrated Communication Optical Module

Initial Print Date: 06/08 Revision Date:

Integrated Communication Optical Module (ICOM)

Model: All

Production: All

OBJECTIVES

After completion of this module you will be able to:

- Identify the ICOM Modules.
- Explain and identify the purpose of the ICOM A, B, and C.
- Explain the purpose of the LEDs on the ICOM A.

Introduction

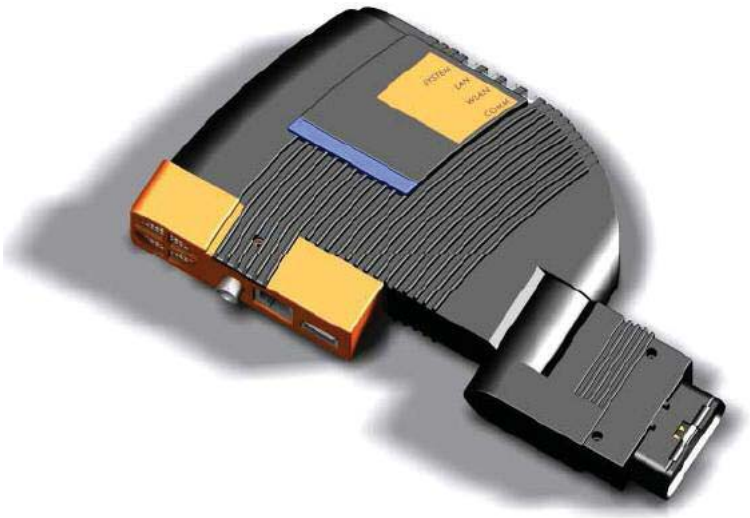
The Integrated Communication Optical Module (ICOM) is set of powerful vehicle interfaces to be used with the Integrated Service Information Display (ISID) device.

The ICOM consists of the following components:

- **ICOM A** is the basic component. Physically, it provides the interfaces for connection to the vehicle OBD II diagnostic interface on the one hand and the interfaces for adaptive integration into the workshop network on the other. A powerful computer core enables it to work as a protocol converter to assume the data interchange between the tester and the vehicle control units as well as the signal processing for connection of the measurement system (IMIB). The power is supplied by KL 30 across the vehicle interface.
- **ICOM B** is the external MOST (Media Oriented Systems Transport) interface for the ICOM A. It is connected to the ICOM A using the supplied USB cable or a commercially available USB cable of the type A-B. The power is supplied across the ICOM A by way of a USB cable connection.
- **ICOM C** is an intelligent interface adapter that adapts the physical OBD II to the BMW circular socket. As an extended supplementary module, it connects ICOM A to vehicles without an OBD II female interface. The power supply is supplied at the vehicle by way of KL 30 from the BMW 20 pin circular socket.

ICOM A

The ICOM A is the basic component. Physically, it provides the interfaces for connection to the vehicle OBD II female diagnostic interface connector. A powerful computer core enables it to work as a protocol converter to assume the data interchange between the tester and the vehicle control units as well as the signal processing for connection of the measurement system (IMIB). The power supply is supplied by way of KL 30 across the vehicle interface. The ICOM A is specified rated in electrical operation for a minimum voltage of 8 V. Stable operation is only ensured if the power supply is above the minimum voltage limit.



ICOM A Vehicle Interfaces

ICOM A vehicle interfaces to the female 16 pin OBD II vehicle socket.

OBD II Pin	Interface Signal
1	KI 15 (Ignition on)
2	SIA Reset signal
3	Ethernet Rx+
4	Ground (-)
5	Ground (-)
6	CAN High
7	K-Line 1
8	K-Line 2
9	TD Signal (RPM)
10	Not used
11	Ethernet Rx -
12	Ethernet Tx +
13	Ethernet Tx -
14	CAN Low
15	Not used
16	KL 30 (Battery Voltage)

ICOM A can be connected to the workshop network by a Ethernet LAN cable or wireless connection by WLAN. The maximum data rate is 100 Mbit/s.

The IMIB can be connected by way of a Lemo connector to the ICOM A.

The communication for the MOST Bus is supplied by ICOM B. For this purpose ICOM B is to be connected with the ICOM A by way of a supplied USB cable.
The host communication is thru either a workshop network LAN connection or WLAN.

Index	Explanation
1	ICOM A
2	ICOM B
3	USB Cable (A B)
4	Ethernet Cable from Workshop Network

The ICOM A includes a (4) four LED display. These LED's displays the following information and warnings:

- One 2-color LED label **"SYSTEM"** for the general status:

  Green ---------- system ready

  Green flashing---------- system booting

  Red ---------- system fault

  Off ---------- system off

- One 2-color LED label **"LAN"** for the status of ICOM A communication by Ethernet:

  Green ---------- Ethernet connection active (flashing if Traffic)

  Off ---------- no LAN communication

- One 2-color LED label **"WLAN"** for the status of the ICOM A:

  Green ---------- Infrastructure (flashing if Traffic) Source: ISAP

  Yellow ---------- Ad-hoc (flashing if Traffic) ISAP offline

  Off ---------- no WLAN communication

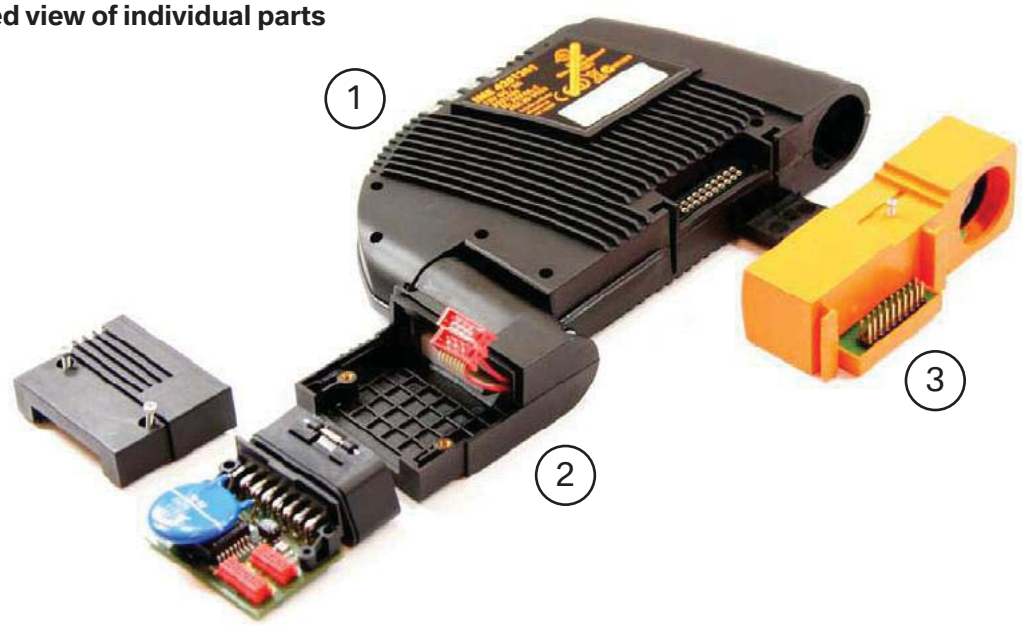
- One 2-color LED label **"COMM"** for the status of K-line, D_CAN or vehicle Ethernet

ICOM A Modular Structure

Due to a limited number of connect cycles, contact elements to connect assemblies are subject to mechanical wear. The ICOM A concept enables replacement of wear parts, if required, with minimum overhead in order to preserve full functions of the overall device over a sustained period.

Wear parts are the OBD II module (2) and the fan / connector module (3).

Exploded view of individual parts



Index	Explanation
1	ICOM A Base Module
2	OBD II Module
3	Fan / Connector Module

High Temperature in the ICOM A Working Environment

High temperatures in the working environment of the ICOM A can have negative effects on the hardware during regular operation. A separate fan is provided for the ICOM A tool that is activated depending on the temperature increase inside the ICOM A. The fan ensures that the air is circulated, thus protecting the ICOM A against heat damage.
The maximum permitted outside temperature is 45°C. If this limit value is exceeded, an irreparable malfunction in the hardware can occur. (thermo shutdown takes place) It must be ensured that the recirculation channel of the fan is not blocked by any objects during regular operation. The fan is activated, when the temperature inside the ICOM A exceeds a preset temperature value. The fan will remain on until the temperature drops below a preset limit value.

ICOM B

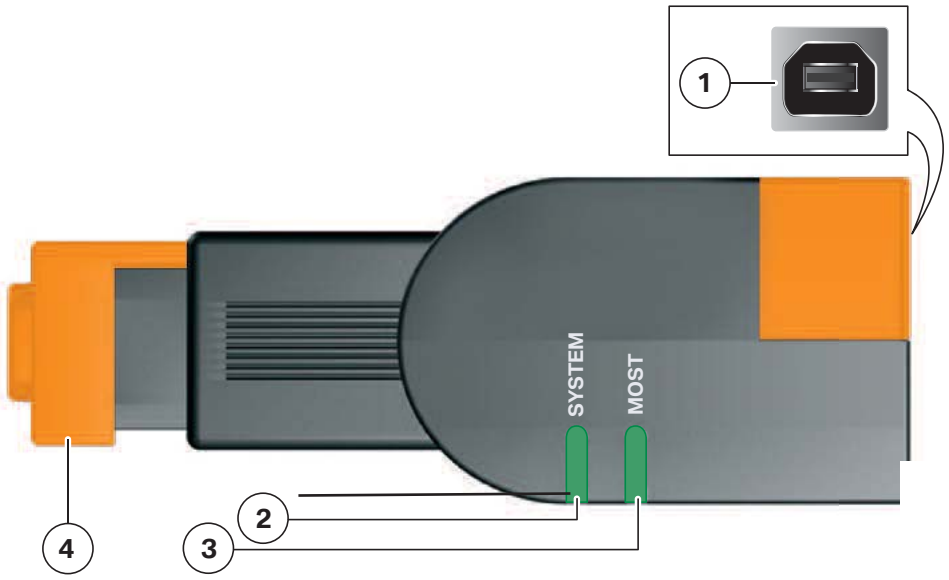
The ICOM B is the external MOST (Media Oriented Systems Transport) interface of the ICOM A. It is connected to the ICOM A using the supplied USB cable or a commercially available USB cable of the type A-B. The power is supplied across the ICOM A by way of a USB cable connection.

During electrical operation, the ICOM B is only operational when the ICOM A is being supplied with a minimum voltage of 8 V. If a cable other than that which is supplied is used for the data connection for the ICOM A. The cable must complies with the USB 2.0 High Speed specification and is free of mechanical damage of any kind.

Note: Initially ICOM B will not be used for diagnostics. It is therefore, not supported by Integrated Service Processes Application 2.x.

MOST interface ICOM B

Connection of ICOM A with ICOM B



Index	Explanation
1	USB Connection (Type B)
2	ICOM B “SYSTEM” status LED
3	“MOST” status LED
4	MOST interface connection

Index	Explanation
1	ICOM A
2	ICOM B
3	USB Cable (A B)
4	Ethernet Cable from Workshop Network

The ICOM B includes a (2) two LED display. These LED's displays the following information and warnings:

- One 2-color LED label "SYSTEM" for the general status:

  Off ---------- no power or problems with power supply

  Yellow ---------- initializing ICOM B

  Red flashing ---------- problems with booting/initializing

  Green ---------- ready

  Green flashing ---------- communication

- One 2-color LED label "MOST" for the status of MOST communication Ethernet:

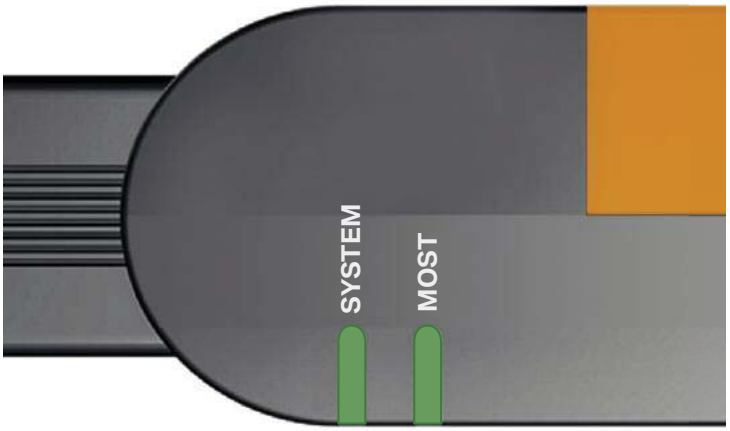
  Off ---------- no light at MOST

  Red ---------- no lockable light

  Green ----------stable LOCK

  Yellow *****---------- no stable LOCK

*** Yellow = the relevant LED lights up simultaneously red and green.**



Light-emitting diodes on the ICOM B housing

ICOM C

The ICOM C is an intelligent interface adapter that adapts the physical 16 pin female OBD II socket to the BMW 20 pin circular socket. As an extended supplementary module, it connects ICOM A to BMW vehicles which do not have a 16 pin OBD II female interface. (older vehicles from the model E30 onwards). The power is supply from the vehicle by way of KL 30 (+) of pin 14 of the BMW 20 pin circular socket.

The ICOM C is rated for electrical operation of a minimum voltage of 8 V. The voltage at KL30 is routed inside the ICOM C to the OBD II. This is how power provided to the ICOM A. Stable interaction of both devices (ICOM A & ICOM B) is only ensured when the vehicle's battery voltage is maintain above the 8 V minimum limit.

The BMW 20 pin round diagnostics connector contains a microprocessor that adapts the read data from the vehicle to the data format of ICOM A. (a protocol convertor)

Connection of ICOM A with ICOM C

On the vehicle, the ICOM C is connected via the BMW 20 pin circular connector.

Circular connector of the ICOM C

View of the ICOM A and ICOM C connected to a vehicle.

Index	Explanation
1	ICOM A
2	ICOM B
3	Workshop Network LAN Cable

ICOM C Vehicle Interfaces

Following interfaces are supplied by ICOM C to ICOM A:

Pin at 16 pin OBD II II Socket	Signal	Pin at 20 pin BMW round socket
1	KL 15 (Ignition on)	16
2	SIA Reset / Ethernet Activation	7
4	KL 31 (GND -)	19
5	KL 31 (GND -)	19
7	K-Line 1	17, 20
8	K-Line 2	18
9	KL 1 TD (RPM)	1
16	KL 30 (+)	14
-	Programming Voltage	18